



# SEQUENCE LISTING

<110> UNIVERSITY OF SOUTHERN CALIFORNIA  
Markland, Francis S.  
Ritter, Matthew

<120> CONTORTROSTATIN (CN) AND METHODS FOR ITS USE IN PREVENTING METASTASIS  
AND OTHER CONDITIONS

<130> 1279-338N3/09801388

<140> Not yet assigned

<141> 2003-11-12

<150> US09/591,552

<151> 2000-06-08

<150> US 08/141,321

<151> 1993-10-22

<150> US 08/540,423

<151> 1995-10-10

<150> US 08/632,691

<151> 1996-04-15

<150> US 08/745,603

<151> 1996-11-08

<150> US 09/163,047

<151> 1998-09-29

<150> US09/460,295

<151> 1999-12-10

<160> 15

<170> PatentIn version 3.1

<210> 1

<211> 2029

<212> DNA

<213> Agkistrodon contortrix

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<213> Agkistrodon contortrix

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Val Leu Tyr Pro Gln Lys Val Thr Ala Leu Pro Lys Gly Ala Val Gln  
35 40 45

Pro Lys Tyr Glu Asp Thr Met Gln Tyr Glu Phe Lys Val Asn Gly Glu  
50 55 60

Pro Val Val Leu His Leu Glu Lys Asn Lys Gly Leu Phe Ser Lys Asp  
65 70 75 80

Tyr Ser Glu Thr His Tyr Ser Ser Asp Gly Arg Lys Ile Thr Thr Asn  
85 90 95

Pro Pro Val Glu Asp His Cys Tyr Tyr His Gly Arg Ile Gln Asn Asp  
100 105 110

Ala Asp Ser Thr Ala Ser Ile Ser Ala Cys Asn Gly Leu Lys Gly His  
115 120 125

Phe Lys Leu Gln Gly Glu Thr Tyr Leu Ile Glu Pro Leu Lys Leu Ser  
130 135 140

Asp Ser Glu Ala His Ala Val Tyr Lys Tyr Glu Asn Val Glu Lys Glu  
145 150 155 160

Asp Glu Ala Pro Lys Met Cys Gly Val Thr Gln Thr Asn Trp Glu Ser  
165 170 175

Asp Glu Pro Ile Lys Lys Ala Ser Gln Leu Asn Leu Thr Pro Glu Gln  
180 185 190

Gln Gly Phe Pro Gln Arg Tyr Ile Glu Leu Val Val Val Ala Asp His  
195 200 205

Arg Met Phe Thr Lys Tyr Asn Gly Asn Leu Asn Thr Ile Arg Ile Trp  
210 215 220

Val His Glu Leu Val Asn Thr Met Asn Val Phe Tyr Arg Pro Leu Asn  
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Ile Arg Val Ser Leu Thr Asp Leu Glu Val Trp Ser Asp Gln Asp Leu  
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Ile Asn Val Gln Pro Ala Ala Ala Asp Thr Leu Glu Ala Phe Gly Asp  
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Trp Arg Glu Thr Val Leu Leu Asn Arg Ile Ser His Asp Asn Ala Gln  
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Leu Leu Thr Ala Ile Glu Leu Asp Gly Glu Thr Ile Gly Leu Ala Asn  
290 295 300

Arg Gly Thr Met Cys Asp Pro Lys Leu Ser Thr Gly Ile Val Gln Asp  
305 310 315 320

His Ser Ala Ile Asn Leu Trp Val Ala Val Thr Met Ala His Glu Met  
325 330 335

Gly His Asn Leu Gly Ile Ser His Asp Gly Asn Gln Cys His Cys Asp  
340 345 350

Ala Asn Ser Cys Ile Met Ser Glu Glu Leu Arg Glu Gln Leu Ser Phe  
355 360 365

Glu Phe Ser Asp Cys Ser Gln Asn Gln Tyr Gln Thr Tyr Leu Thr Asp  
370 375 380

His Asn Pro Gln Cys Met Leu Asn Glu Pro Leu Arg Thr Asp Ile Val  
385 390 395 400

Ser Thr Pro Val Ser Gly Asn Glu Leu Leu Glu Thr Gly Glu Glu Ser  
405 410 415

Asp Phe Asp Ala Pro Ala Asn Pro Cys Cys Asp Ala Ala Thr Cys Lys  
420 425 430

Leu Thr Thr Gly Ser Gln Cys Ala Asp Gly Leu Cys Cys Asp Gln Cys  
 435 440 445

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 gcgatgctgc aacctgtaaa c 21

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 <211> 71  
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 <213> Agkistrodon piscivorus

<400> 7

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20 25 30

Leu Cys Cys Asp Gln Cys Lys Phe Met Lys Glu Gly Thr Val Cys Arg  
35 40 45

Ala Arg Gly Asp Asp Val Asn Asp Tyr Cys Asn Gly Ile Ser Ala Gly  
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Cys Pro Arg Asn Pro Phe His  
65 70

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<212> PRT

<213> Trimeresurus gramineus

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20 25 30

Leu Cys Cys Asp Gln Cys Ser Phe Ile Glu Glu Gly Thr Val Cys Arg  
35 40 45

Ile Ala Arg Gly Asp Asp Leu Asp Asp Tyr Cys Asn Gly Arg Ser Ala  
50 55 60

Gly Cys Pro Arg Asn Pro Phe His Met Ile Gln Val Leu Leu Ile Thr  
65 70 75 80

Ile Cys Leu Ala Val Phe Pro Tyr Gln Gly Ser Ser Ile Ile Leu Glu  
85 90 95

Ser Gly Asn Leu Asn Asp Tyr Glu Val Val Tyr Pro Glu Lys Val Thr  
100 105 110

Ala Leu Pro Lys Gly Ala Val Gln Gln Lys Tyr Glu Asp Ala Met Gln  
115 120 125

Tyr Glu Phe Lys Val Asn Gly Glu Pro Val Val Leu His Leu Glu Lys  
130 135 140

Asn Lys Gly Leu Phe Ser Glu Asp Tyr Ser Glu Ile His Tyr Ser Pro  
145 150 155 160

Asp Gly Arg Glu Ile Thr Ala Tyr Pro Ser Val Glu Asp His Cys Tyr  
165 170 175

Tyr His Gly Arg Ile Glu Asn Asp Ala Asp Ser Thr Ala Ser Ile Ser  
180 185 190

Ala Cys Asp Gly Leu Lys Gly His Phe Lys Leu Gln Gly Glu Met Tyr  
195 200 205

Leu Ile Glu Pro Leu Glu Leu Ser Asp Ser Glu Ala His Ala Val Phe  
210 215 220

Lys Tyr Glu Asn Val Glu Lys Glu Asp Glu Pro Pro Lys Met Cys Gly  
225 230 235 240

Val Thr Gln Asn Trp Glu Ser Tyr Glu Ser Thr Lys Lys Ala Ser Gln  
245 250 255

Leu Asn Val Thr Pro Glu Gln Gln Arg Phe Pro Gln Arg Tyr Ile Lys  
260 265 270

Leu Gly Ile Phe Val Asp His Gly Met Tyr Thr Lys Tyr Ser Gly Asn  
275 280 285

Ser Glu Arg Ile Thr Lys Arg Val His Gln Met Ile Asn Asn Ile Asn  
290 295 300

Met Met Cys Arg Ala Leu Asn Ile Val Thr Thr Leu Ser Val Leu Glu  
305 310 315 320

Ile Trp Ser Glu Lys Asp Leu Ile Thr Val Gln Ala Ser Ala Pro Thr  
325 330 335

Thr Leu Thr Leu Phe Gly Ala Trp Arg Glu Thr Val Leu Leu Asn Arg  
340 345 350

Thr Ser His Asp His Ala Gln Leu Leu Thr Ala Thr Ile Phe Asn Gly  
355 360 365

Asn Val Ile Gly Arg Ala Pro Val Gly Gly Met Cys Asp Pro Lys Arg  
370 375 380

Ser Val Ala Ile Val Arg Asp His Asn Ala Ile Val Phe Val Val Ala  
385 390 395 400

Val Thr Met Thr His Glu Met Gly His Asn Leu Gly Met His His Asp  
405 410 415

Glu Asp Lys Cys Asn Cys Asn Thr Cys Ile Met Ser Lys Val Leu Ser  
420 425 430

Arg Gln Pro Ser Lys Tyr Phe Ser Glu Cys Ser Lys Asp Tyr Tyr Gln  
435 440 445

Thr Phe Leu Thr Asn His Asn Pro Gln Cys Ile Leu Asn Ala Pro Leu  
450 455 460

Arg Thr Asp Thr Val Ser Thr Pro Val Ser Gly Asn Glu Leu Leu Glu  
465 470 475 480

Ala Gly Glu Asp Cys Asp Cys Gly Ser Pro Ala Asn Pro Cys Cys Asp  
485 490 495

Ala Ala Thr Cys Lys Leu Ile Pro Gly Ala Gln Cys Gly Glu Gly Leu  
500 505 510

Cys Cys Asp Gln Cys Ser Phe Ile Glu Glu Gly Thr Val Cys Arg Ile  
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530 535 540

Cys Pro Arg Asn Pro Phe His Ala  
545 550



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<213> Trimeresurus albolabris

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Asp Ala Ala Thr Cys Lys Leu Leu Pro Gly Ala Gln Cys Gly Glu Gly  
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Leu Cys Cys Asp Gln Cys Ser Phe Met Lys Lys Gly Thr Ile Cys Arg  
35 40 45

Arg Ala Arg Gly Asp Asp Leu Asp Asp Tyr Cys Asn Gly Ile Ser Ala  
50 55 60

Gly Cys Pro Arg Asn Pro Leu His Ala  
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<212> PRT  
<213> Trimeresurus elegans

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Asp Ala Ala Thr Cys Lys Leu Arg Pro Gly Ala Gln Cys Ala Asp Gly  
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Leu Cys Cys Asp Gln Cys Arg Phe Lys Lys Lys Arg Thr Ile Cys Arg  
35 40 45

Arg Ala Arg Gly Asp Asn Pro Asp Asp Arg Cys Thr Gly Gln Ser Ala  
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Asp Cys Pro Arg Asn Gly Leu Tyr Ser  
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<213> Calloselasma rhodostoma

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20 25 30

Cys Glu Gln Cys Lys Phe Asp Arg Ala Gly Lys Ile Cys Arg Ile Pro  
35 40 45

Arg Gly Asp Met Pro Asp Asp Arg Cys Thr Gly Gln Ser Ala Asp Cys  
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Pro Arg Tyr His  
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<210> 12

<211> 606

<212> PRT

<213> Crotalus atrox

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20 25 30

Val Ile Tyr Pro Arg Lys Val Thr Ala Leu Pro Lys Gly Ala Val Gln  
35 40 45

Pro Lys Tyr Glu Asp Ala Met Gln Tyr Glu Leu Lys Val Asn Gly Glu  
50 55 60

Pro Val Val Leu His Leu Gly Lys Asn Lys Gly Leu Phe Ser Lys Asp  
65 70 75 80

Tyr Ser Glu Thr His Tyr Ser Pro Asp Gly Arg Glu Ile Thr Thr Tyr  
85 90 95

Pro Leu Val Glu Asp His Cys Tyr Tyr His Gly Ile Glu Asn Asp Ala  
100 105 110

Asp Ser Thr Ala Ser Ile Ser Ala Cys Asn Gly Leu Lys Gly His Phe  
115 120 125

Lys Leu Gln Gly Glu Met Tyr Leu Ile Glu Pro Leu Lys Leu Pro Asp  
130 135 140

Ser Glu Ala His Ala Val Tyr Lys Tyr Glu Asn Val Glu Lys Glu Asp  
145 150 155 160

Glu Ala Leu Lys Met Cys Gly Val Thr Gln Asn Trp Glu Ser Tyr Glu  
165 170 175

Pro Ile Lys Lys Ala Ser Gln Leu Val Val Thr Ala Glu His Gln Lys  
180 185 190

Tyr Asn Pro Phe Arg Phe Val Glu Leu Phe Leu Val Val Asp Lys Ala  
195 200 205

Met Val Thr Lys Asn Asn Gly Asp Leu Asp Lys Ile Lys Thr Arg Met  
210 215 220

Tyr Glu Ile Val Asn Thr Val Asn Glu Ile Tyr Arg Tyr Met Tyr Ile  
225 230 235 240

His Val Ala Leu Val Gly Leu Glu Ile Trp Ser Asn Glu Asp Lys Ile  
245 250 255

Thr Val Lys Pro Glu Ala Gly Tyr Thr Leu Asn Ala Phe Gly Glu Trp  
260 265 270

Arg Lys Thr Asp Leu Leu Thr Arg Lys Lys His Asp Asn Ala Gln Leu  
275 280 285

Leu Thr Ala Ile Asp Leu Asp Arg Val Ile Gly Leu Ala Tyr Val Gly  
290 295 300

Ser Met Cys His Pro Lys Arg Ser Thr Gly Ile Ile Gln Asp Tyr Ser  
305 310 315 320

Glu Ile Asn Leu Val Val Ala Val Ile Met Ala His Glu Met Gly His  
325 330 335

Asn Leu Gly Ile Asn His Asp Ser Gly Tyr Cys Ser Cys Gly Asp Tyr  
340 345 350

Ala Cys Ile Met Arg Pro Glu Ile Ser Pro Glu Pro Ser Thr Phe Phe  
355 360 365

Ser Asn Cys Ser Tyr Phe Glu Cys Trp Asp Phe Ile Met Asn His Asn  
370 375 380

Pro Glu Cys Ile Leu Asn Glu Pro Leu Gly Thr Asp Ile Ile Ser Pro  
385 390 395 400

Pro Val Cys Gly Asn Glu Leu Leu Glu Val Gly Glu Glu Cys Asp Cys  
405 410 415

Gly Thr Pro Glu Asn Cys Gln Asn Glu Cys Cys Asp Ala Ala Thr Cys  
420 425 430

Lys Leu Lys Ser Gly Ser Gln Cys Gly His Gly Asp Cys Cys Glu Gln  
435 440 445

Cys Lys Phe Ser Lys Ser Gly Thr Glu Cys Arg Ala Ser Met Glu Cys  
450 455 460

Asp Pro Ala Glu His Cys Thr Gly Gln Ser Ser Glu Cys Pro Ala Asp  
465 470 475 480

Val Phe His Lys Asn Gly Gln Pro Cys Leu Asp Asn Tyr Gly Tyr Cys  
485 490 495

Tyr Asn Gly Asn Cys Pro Ile Met Tyr His Gln Cys Tyr Asp Leu Phe  
500 505 510

Gly Ala Asp Val Tyr Glu Ala Glu Asp Ser Cys Phe Glu Arg Asn Gln  
515 520 525

Lys Gly Asn Tyr Tyr Gly Tyr Cys Arg Lys Glu Asn Gly Asn Lys Ile  
530 535 540

Pro Cys Ala Pro Glu Asp Val Lys Cys Gly Arg Leu Tyr Cys Lys Asp  
545 550 555 560

Asn Ser Pro Gly Asn Asn Pro Cys Lys Met Glu Tyr Ser Asn Glu Asp

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570

575

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 595 600 605

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<400> 13

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 20 25 30

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 35 40 45

Pro Asp Gly Arg Glu Ile Thr Thr Tyr Pro Pro Val Glu Asp His Cys  
 50 55 60

Tyr Tyr His Gly Arg Ile Glu Asn Asp Ala Asp Ser Thr Ala Ser Ile  
 65 70 75 80

Ser Ala Cys Asn Gly Leu Lys Gly Tyr Phe Lys Leu Gln Arg Glu Thr  
 85 90 95

Tyr Phe Ile Glu Pro Leu Lys Leu Pro Asp Ser Glu Ala His Ala Val  
 100 105 110

Phe Lys Tyr Glu Asn Val Glu Lys Glu Asp Glu Ala Pro Lys Met Cys  
 115 120 125

Gly Val Thr Gln Asn Trp Lys Ser Tyr Glu Pro Ile Lys Lys Ala Ser  
 130 135 140

Gln Leu Ala Phe Thr Ala Glu Gln Gln Arg Tyr Asp Pro Tyr Lys Tyr  
 145 150 155 160

Ile Glu Phe Phe Val Val Val Asp Gln Gly Thr Val Thr Lys Asn Asn  
165 170 175

Gly Asp Leu Asp Lys Ile Lys Ala Arg Met Tyr Glu Leu Ala Asn Ile  
180 185 190

Val Asn Glu Ile Phe Arg Tyr Leu Tyr Met His Val Ala Leu Val Gly  
195 200 205

Leu Glu Ile Trp Ser Asn Gly Asp Lys Ile Thr Val Lys Pro Asp Val  
210 215 220

Asp Tyr Thr Leu Asn Ser Phe Ala Glu Trp Arg Lys Thr Asp Leu Leu  
225 230 235 240

Thr Arg Lys Lys His Asp Asn Ala Gln Leu Leu Thr Ala Ile Asp Phe  
245 250 255

Asn Gly Pro Thr Ile Phe Tyr Ala Tyr Ile Gly Ser Met Cys His Pro  
260 265 270

Lys Arg Ser Val Gly Ile Val Gln Asp Tyr Ser Pro Ile Asn Leu Val  
275 280 285

Val Ala Val Ile Met Ala His Glu Met Gly His Asn Leu Gly Ile His  
290 295 300

His Asp Thr Gly Ser Cys Ser Cys Gly Asp Tyr Pro Cys Ile Met Gly  
305 310 315 320

Pro Thr Ile Ser Asn Glu Pro Ser Lys Phe Phe Ser Asn Cys Ser Tyr  
325 330 335

Ile Gln Cys Trp Asp Phe Ile Met Asn His Asn Pro Glu Cys Ile Ile  
340 345 350

Asn Glu Pro Leu Gly Thr Asp Ile Ile Ser Pro Pro Val Cys Gly Asn  
355 360 365

Glu Leu Leu Glu Val Gly Glu Glu Cys Asp Cys Gly Thr Pro Glu Asn  
370 375 380

Cys Gln Asn Glu Cys Cys Asp Ala Ala Thr Cys Lys Leu Lys Ser Gly  
385 390 395 400

Ser Gln Cys Gly His Gly Asp Cys Cys Glu Gln Cys Lys Phe Ser Lys  
405 410 415

Ser Gly Thr Glu Cys Arg Ala Ser Met Ser Glu Cys Asp Pro Ala Glu  
420 425 430

His Cys Thr Gly Gln Ser Ser Glu Cys Pro Ala Asp Val Phe His Lys  
435 440 445

Asn Gly Gln Pro Cys Leu Asp Asn Tyr Gly Tyr Cys Tyr Asn Gly Asn  
450 455 460

Cys Pro Ile Met Tyr His Gln Cys Tyr Ala Leu Phe Gly Ala Asp Val  
465 470 475 480

Tyr Glu Ala Glu Asp Ser Cys Phe Lys Asp Asn Gln Lys Gly Asn Tyr  
485 490 495

Tyr Gly Tyr Cys Arg Lys Glu Asn Gly Lys Lys Ile Pro Cys Ala Pro  
500 505 510

Glu Asp Val Lys Cys Gly Arg Leu Tyr Cys Lys Asp Asn Ser Pro Gly  
515 520 525

Gln Asn Asn Pro Cys Lys Met Phe Tyr Ser Asn Asp Asp Glu His Lys  
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<212> PRT  
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Val Ile Tyr Pro Arg Lys Val Thr Ala Leu Pro Lys Gly Ala Val Gln  
35 40 45

Pro Lys Tyr Glu Asp Thr Met Gln Tyr Glu Leu Lys Val Asn Gly Glu  
50 55 60

Pro Val Val Leu His Leu Glu Lys Asn Lys Gly Leu Phe Ser Lys Asp  
65 70 75 80

Tyr Ser Glu Thr His Tyr Ser Phe Asp Gly Arg Lys Ile Thr Thr Asn  
85 90 95

Pro Ser Val Glu Asp His Cys Tyr Tyr His Gly Arg Ile Glu Asn Asp  
100 105 110

Ala Asp Ser Thr Ala Ser Ile Ser Ala Cys Asn Gly Leu Lys Gly His  
115 120 125

Phe Lys Leu Gln Gly Glu Met Tyr Leu Ile Glu Pro Leu Lys Leu Ser  
130 135 140

Asp Ser Glu Ala His Ala Val Phe Lys Leu Lys Asn Val Glu Lys Glu  
145 150 155 160

Asp Glu Ala Pro Lys Met Cys Gly Val Thr Gln Asn Trp Glu Ser Tyr  
165 170 175

Glu Pro Ile Lys Lys Ala Ser Asp Leu Asn Leu Asn Pro Glu His Gln  
180 185 190

Arg Tyr Val Glu Leu Phe Ile Val Val Asp His Gly Met Tyr Thr Lys  
195 200 205

Tyr Asn Gly Asp Ser Asp Lys Ile Arg Gln Arg Val His Gln Met Val  
210 215 220

Asn Ile Met Lys Glu Ser Tyr Thr Tyr Met Tyr Ile Asp Ile Leu Leu  
225 230 235 240



Ala Gly Ile Glu Ile Trp Ser Asn Gly Asp Leu Ile Asn Val Gln Pro  
245 250 255

Ala Ser Pro Asn Thr Leu Asn Ser Phe Gly Glu Trp Arg Glu Thr Asp  
260 265 270

Leu Leu Lys Arg Lys Ser His Asp Asn Ala Gln Leu Leu Thr Ser Ile  
275 280 285

Ala Phe Asp Glu Gln Ile Ile Gly Arg Ala Tyr Ile Gly Gly Ile Cys  
290 295 300

Asp Pro Lys Arg Ser Thr Gly Val Val Gln Asp His Ser Glu Ile Asn  
305 310 315 320

Leu Arg Val Ala Val Thr Met Thr His Glu Leu Gly His Asn Leu Gly  
325 330 335

Ile His His Asp Thr Asp Ser Cys Ser Cys Gly Gly Tyr Ser Cys Ile  
340 345 350

Met Ser Pro Val Ile Ser Asp Glu Pro Ser Lys Tyr Phe Ser Asp Cys  
355 360 365

Ser Tyr Ile Gln Cys Trp Glu Phe Ile Met Asn Gln Lys Pro Gln Cys  
370 375 380

Ile Leu Lys Lys Pro Leu Arg Thr Asp Thr Val Ser Thr Pro Val Ser  
385 390 395 400

Gly Asn Glu Leu Leu Glu Ala Gly Ile Glu Cys Asp Gly Gly Ser Leu  
405 410 415

Glu Asn Pro Cys Cys Tyr Ala Thr Thr Cys Lys Met Arg Pro Gly Ser  
420 425 430

Gln Cys Ala Glu Gly Leu Cys Cys Asp Gln Cys Arg Phe Met Lys Lys  
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# SEQUENCE LISTING

<110> Markland, Francis S.  
Ritter, Matthew

<120> Contortrostatin (CN) and Methods for its Use In  
Preventing Metastasis and Other Conditions

<130> USC/09801388/Markland et al

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<150> 09/460,295

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aagtactgta tccacaaaaa gtcactgcat tgcccaaagg agcagttcag ccaaagtatg 240
aagacaccat gcaatatgaa tttaaagtga atggagagcc agtggtcctt cacctggaaa 300
aaaataaagg acttttttca aaagattaca gcgagactca ttattcctct gatggcagaa 360
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 ctaattggga atcagatgag cccatcaaaa aggcctctca gttaaattctt actcctgaac 660  
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			20					25					30		

Val	Leu	Tyr	Pro	Gln	Lys	Val	Thr	Ala	Leu	Pro	Lys	Gly	Ala	Val	Gln
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Pro	Lys	Tyr	Glu	Asp	Thr	Met	Gln	Tyr	Glu	Phe	Lys	Val	Asn	Gly	Glu
	50					55					60				

Pro Val Val Leu His Leu Glu Lys Asn Lys Gly Leu Phe Ser Lys Asp

65	70	75	80
Tyr Ser Glu Thr His Tyr Ser Ser Asp 85	Gly Arg Lys Ile Thr Thr Asn 90 95		
Pro Pro Val Glu Asp His Cys Tyr Tyr 100 105	His Gly Arg Ile Gln Asn Asp 110		
Ala Asp Ser Thr Ala Ser Ile Ser Ala 115 120	Cys Asn Gly Leu Lys Gly His 125		
Phe Lys Leu Gln Gly Glu Thr Tyr Leu 130 135	Ile Glu Pro Leu Lys Leu Ser 140		
Asp Ser Glu Ala His Ala Val Tyr Lys 145 150	Tyr Glu Asn Val Glu Lys Glu 155 160		
Asp Glu Ala Pro Lys Met Cys Gly Val 165	Thr Gln Thr Asn Trp Glu Ser 170 175		
Asp Glu Pro Ile Lys Lys Ala Ser Gln 180 185	Leu Asn Leu Thr Pro Glu Gln 190		
Gln Gly Phe Pro Gln Arg Tyr Ile Glu 195 200	Leu Val Val Val Ala Asp His 205		
Arg Met Phe Thr Lys Tyr Asn Gly Asn 210 215	Leu Asn Thr Ile Arg Ile Trp 220		
Val His Glu Leu Val Asn Thr Met Asn 225 230	Val Phe Tyr Arg Pro Leu Asn 235 240		
Ile Arg Val Ser Leu Thr Asp Leu Glu 245	Val Trp Ser Asp Gln Asp Leu 250 255		
Ile Asn Val Gln Pro Ala Ala Ala Asp 260 265	Thr Leu Glu Ala Phe Gly Asp 270		
Trp Arg Glu Thr Val Leu Leu Asn Arg 275 280	Ile Ser His Asp Asn Ala Gln 285		
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Arg Gly Thr Met Cys Asp Pro Lys Leu 305 310	Ser Thr Gly Ile Val Gln Asp 315 320		
His Ser Ala Ile Asn Leu Trp Val Ala	Val Thr Met Ala His Glu Met		

325

330

335

Gly His Asn Leu Gly Ile Ser His Asp Gly Asn Gln Cys His Cys Asp  
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Ala Asn Ser Cys Ile Met Ser Glu Glu Leu Arg Glu Gln Leu Ser Phe  
 355 360 365

Glu Phe Ser Asp Cys Ser Gln Asn Gln Tyr Gln Thr Tyr Leu Thr Asp  
 370 375 380

His Asn Pro Gln Cys Met Leu Asn Glu Pro Leu Arg Thr Asp Ile Val  
 385 390 395 400

Ser Thr Pro Val Ser Gly Asn Glu Leu Leu Glu Thr Gly Glu Glu Ser  
 405 410 415

Asp Phe Asp Ala Pro Ala Asn Pro Cys Cys Asp Ala Ala Thr Cys Lys  
 420 425 430

Leu Thr Thr Gly Ser Gln Cys Ala Asp Gly Leu Cys Cys Asp Gln Cys  
 435 440 445

Lys Phe Met Lys Glu Gly Thr Val Cys Arg Arg Ala Arg Gly Asp Asp  
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Phe His Ala

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<212> DNA

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21

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